

What is claimed is:

1. A method of judging communication stability of a network system including a master unit forming a programmable controller and a slave connected to a network, said method comprising the steps of:

transmitting from said master unit to said slave a distorted test pattern formed by distorting a standard test pattern to a specified distortion level;

returning a response from said slave to said master unit if said slave receives said distorted test pattern normally; and

judging that said network system has communication stability corresponding to said specified distortion level if said master unit receives said response normally.

2. The method of claim 1 wherein a plurality of distorted test patterns are sequentially transmitted from said master to said slave, each of said distorted test patterns being formed by distorting said standard test pattern to a different one of a plurality of specified distortion levels, said method further comprising the steps of:

determining a boundary, beyond which communication from said master unit to said slave becomes impossible, based on whether or not there is a response from said slave to the distorted test pattern distorted to each of said specified distortion levels; and

determining said communication stability based on said boundary.

3. The method of claim 1 wherein said slave returns said response by distorting said response according to said specified distortion level of the distorted test pattern received from said master unit.

4. The method of claim 2 wherein said slave returns said response by distorting said response according to the one different specified distortion level.

5. The method of claim 1 wherein said network system further includes a repeater connected between said master unit and said slave, said repeater being adapted to carry out waveform shaping on said distorted test pattern to form a corrected signal and

to output said corrected signal after distorting said corrected signal according to said specified distortion level.

6. The method of claim 2 wherein said network system further includes a
5 repeater connected between said master unit and said slave, said repeater being adapted to carry out waveform shaping on said distorted test pattern to output a corrected signal and to output said corrected signal after distorting said corrected signal according to the one different specified distortion level.

10 7. The method of claim 3 wherein said network system further includes a repeater connected between said master unit and said slave, said repeater being adapted to carry out waveform shaping on said distorted test pattern to output a corrected signal and to output said corrected signal after distorting said corrected signal according to said specified distortion level.

15 8. The method of claim 4 wherein said network system further includes a repeater connected between said master unit and said slave, said repeater being adapted to carry out waveform shaping on said distorted test pattern to output a corrected signal and to output said corrected signal after distorting said corrected signal according to the one
20 different specified distortion level.

9. The method of claim 1 wherein said distorted test pattern is generated by changing the duty ratio of said standard test pattern.

25 10. The method of claim 2 wherein each of said distorted test patterns is generated by changing the duty ratio of said standard test pattern.

11. The method of claim 3 wherein said distorted test pattern is generated by changing the duty ratio of said standard test pattern.

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12. The method of claim 4 wherein each of said distorted test patterns is generated by changing the duty ratio of said standard test pattern.

13. The method of claim 5 wherein said distorted test pattern is generated by changing the duty ratio of said standard test pattern.

14. The method of claim 6 wherein each of said distorted test patterns is generated by changing the duty ratio of said standard test pattern.

15. The method of claim 7 wherein said distorted test pattern is generated by changing the duty ratio of said standard test pattern.

16. The method of claim 8 wherein each of said distorted test patterns is generated by changing the duty ratio of said standard test pattern.

17. A master unit forming a programmable controller and being connected to a network, said master unit comprising:

transmitting means for transmitting a distorted test pattern to a slave, said distorted test pattern being formed by distorting a standard test pattern to a specified distortion level, said slave being connected to said network; and

judging means for judging that said network has communication stability corresponding to said specified distortion level if said master unit receives a response normally from said slave, said slave being adapted to return said response when said distorted test pattern is received normally.

18. A slave that is connected to a network together with a master unit forming a programmable controller, said slave comprising:

judging means for judging whether or not a distorted test pattern distorted to a specified distortion level and transmitted from said master unit through said network has been received normally;

distorting means for distorting a response according to said specified distortion level, if said distorted test pattern has been normally received; and
returning means for returning said distorted response to said master unit.

5 19. A repeater for a network system including a master unit, a slave and one or more repeaters including said repeater between said master unit and said slave, said repeater comprising:

 waveform shaping means for carrying out waveform shaping on a distorted test pattern distorted to a specified distortion level and sent from said master unit; and

10 outputting means for distorting the waveform-shaped test pattern according to said specified distortion level and outputting the distorted waveform-shaped test pattern.